

What is claimed is:

1. A valve operation device of an internal combustion engine, comprising:

a camshaft which interlockingly rotates around a crankshaft of the internal combustion engine;

5 a valve operation cam pivotally supported on the camshaft to open and close an engine valve that comprises one of an intake valve and an exhaust valve;

a driving cam which integrally rotates with the camshaft;

10 an interlocking mechanism through which the driving cam rocks the valve operation cam around the camshaft; and

a driving mechanism which rocks the interlocking mechanism around the camshaft,

wherein the driving cam includes a base circle  
15 portion having a sectional shape of a circular arc, and a cam swelled portion having a sectional shape in which a radius from a center different from a center of the base circle portion increases and decreases in a rotation direction of the camshaft,

20 opening and closing of the engine valve start at a damping portion of the valve operation cam, and the driving mechanism rocks the valve operation cam around the camshaft via the interlocking mechanism to control an opening timing

and a closing timing of the engine valve, and

the cam swelled portion of the driving cam has a constant velocity portion at which a lift velocity, which is a ratio of a change in a height of the cam swelled portion with respect to a change in a rotational angle of the camshaft, is constant, and the constant velocity portion is provided over an angular width that includes at least the opening timing in a most advanced angle position of the opening timing of the engine valve and the opening timing in a most retarded angle position of the opening timing of the engine valve.

2. The valve operation device of an internal combustion engine according to claim 1,

wherein the angular width includes at least an angular range which ranges from the opening timing in the most advanced angle position of the engine valve to the closing timing in the most retarded angle position of the engine valve.

3. The valve operation device of an internal combustion engine according to claim 2,

wherein the angular width includes a starting position of the damping portion of the valve operation cam in the most advanced angle position and an ending position

of the damping portion of the valve operation cam in the most retarded angle position.